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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,626	09/18/2003	David R. Mekala	58446US002	9235

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EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	**PAPER NUMBER**
1745	

NOTIFICATION DATE	DELIVERY MODE
06/13/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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LegalDocketing@mmm.com

Office Action Summary	Application No.	Applicant(s)	
	10/666,626	MEKALA ET AL.	
	Examiner	Art Unit	
	Tony Chuo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *13-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-30 are currently pending. Claims 13-29 are withdrawn from further consideration as being drawn to a non-elected invention. The amended claim does overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 1-12 and 30 are rejected under the following new 103 rejections. This action is made FINAL as necessitated by the amendment.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 6, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743). The Barton reference discloses a gas diffusion backing comprising a porous carbon paper "1" impregnated with a first fluorinated polymer as a first layer and a microporous layer "5" of a second fluorinated polymer which contains carbon particles wherein the first fluorinated polymer is hydrophobic and the second fluorinated polymer is hydrophilic (See page 7, lines 8-19 and Figure 1). It also discloses a hydrophobic layer "1" that has a thickness of about 180 microns and a hydrophilic layer "5" that has a thickness of about 1 to 100 microns (See page 14, lines

18-19 and page 17, lines 27-30). It also discloses an intermediate layer between the carbon paper and the microporous layer (See page 8, lines 19-22). It also discloses a fuel cell catalyst layer "7" in contact with the hydrophilic layer "5" (See Figure 2 and page 15, lines 15-32). It also discloses that in general, thinner coatings of the hydrophilic layer "5" will promote mass transport across the coating (See page 14, lines 32-33). It also discloses that routine experimentation is employed to optimize the hydrophilic layer "5" for a particular application (See page 15, lines 4-5).

However, Barton et al does not expressly teach a hydrophilic surface layer that has a thickness of no more than 0.5 micron. However, it has been held that the discovery of an optimum value of a result effective variable by routine experimentation in a known process is ordinarily within the skill of the art (*In re Boesch*, 205 USPQ 215 (CCPA 1980)).

Examiner's note: As disclosed in the Barton reference, the thickness of the hydrophilic layer is recognized in the art as a results effective variable that promotes mass transport across the layer.

4. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743). The Barton reference is applied to claims 1, 2, and 4 for reasons stated above. However, Barton et al does not expressly teach a third layer comprising a carbon fiber construction coated with a fluoropolymer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a third layer comprising a carbon fiber construction coated with a fluoropolymer that is identical to the second layer

because duplication of parts was held to have been obvious (*In re Harza* 124 USPQ 378 (CCPA 1960)). Moreover, the reference discusses an intermediate layer (See page 8, line 18-22).

5. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743) as applied to claim 1 above, and further in view of Nagamori et al (JP 11-045733). However, Barton et al does not expressly teach a hydrophilic surface layer comprising functional groups containing Si, a metal, or Si and O. The Nagamori reference discloses a hydrophilic layer "6" of a gas diffusion electrode that contains SiO_2 and Al_2O_3 as the ingredient of a hydrophilic property (See paragraph [0028]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a hydrophilic surface layer comprising functional groups containing Si, a metal, or Si and O in order to maintain the optimum moisture content of the electrolyte membrane and improve the performance of the fuel cell.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743) as applied to claim 1 above, and further in view of Segit et al (WO 02/22952). However, the Barton reference does not expressly disclose a roll good comprising the fuel cell gas diffusion layer. The Segit reference discloses a fuel cell electrode substrate that is flexible and can be made as roll goods (See Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a roll good comprising the fuel cell gas diffusion layer in order to manufacture the gas diffusion

layer by a continuous, high volume manufacturing process that permits wide variability in different properties of the gas diffusion layer.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al (WO 03/058743) as applied to claim 1 above, and further in view of Taniguchi et al (US 6083638). However, Barton et al does not expressly disclose a hydrophilic surface layer that is present on less than all of the hydrophobic second layer, according to a pattern. The Taniguchi reference discloses a hydrophilic layer "203" that is present on less than all of the hydrophobic layer "202", according to a pattern (See Figure 6(b) and column 12, lines 49-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barton gas diffusion backing to include a hydrophilic surface layer that is present on less than all of the hydrophobic second layer, according to a pattern in order to prevent water from collecting in the gas flow channels while maintaining proper moisture levels in the electrode layers.

Response to Arguments

8. Applicant's arguments with respect to claims 1-12 and 30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

JONATHAN CREPEAU
PRIMARY EXAMINER